



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(71) Applicant: FILA U.S.A., INC. [US/US]; Executive Plaza III, Suite 1200, 11350 McCormick Road, Hunt Valley, MD 21031 (US). (72) Inventor: CROWLEY, Kevin, J. ; 34 Pickpocket Road, Brentwood, NH 03833 (US). (74) Agents: BUCCI, Peter et al.; Davis Hoxie Faithfull & Hapgood, 45 Rockefeller Plaza, New York, NY 10111 (US).			
<p><b>(54) Title:</b> SHOE HAVING AN ARTICULATE COLLAR AND METHOD FOR MAKING SAME</p> <p><b>(57) Abstract</b></p> <p>A shoe (1) consisting of an upper (2), a sole (4), and an articulate collar (6) located on the upper portion at the rear of the shoe. The articulate collar (6) has a plurality of support members (7) which cradle and protect a user's achilles tendon area. The articulate collar resembles a cage-like structure, laterally supports a user's ankle and may provide ventilation. The support members (7) can move in concert with the movement of a user's foot. The invention also relates to a method of constructing a shoe (1) having an articulate collar (6).</p>			

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- 1 -

SHOE HAVING AN ARTICULATE COLLAR  
AND METHOD FOR MAKING SAME

Field of the Invention

The invention pertains to a shoe consisting of an upper, a sole, and an articulate collar located on the upper portion at the rear of the shoe. The articulate collar contacts and protects the achilles tendon area of a user's foot, and provides lateral support for the user's ankle.

5 The invention also pertains to a method of constructing a shoe that has an articulate collar.

Background of the Invention

There exists a longstanding need for a durable, light-weight shoe which protects the achilles tendon area and provides adequate lateral support for a user's ankle, while at the same time is comfortable to wear. Some prior art sport shoes incorporated padding for comfort, but the padding did little to provide ankle support. Others used rigid members to provide ankle support, which proved to be uncomfortable for the user.

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- 2 -

Summary of the Invention

The present invention relates to a shoe which utilizes an articulate collar located at the rear of the shoe above the heel area. The articulate collar provides lateral support  
5 for the ankle of a user, and at the same time comfortably cradles and protects the achilles tendon area of the user's foot. The present invention also relates to a method of constructing a shoe that has an articulate collar.

The articulate collar is located above the heel area of  
10 the shoe, and has support members spaced from one another. The support members can move in a vertical plane in concert with the movement of the user's foot.

In one embodiment, the articulate collar comprises three support members having two openings therebetween. The  
15 openings provide ventilation and permit the support members to move as a user steps, walks, runs or jumps. An attached inner lining may be provided to aid in holding a user's foot in place within the shoe.

An object of the present invention is to provide a light-weight, durable and comfortable shoe which provides adequate lateral support for a user's ankle, while at the same time comfortably protects a user's achilles tendon area. Another object of the present invention is to provide a method of constructing an improved shoe having an articulate collar.  
25

Further objects and advantages of the present invention will be apparent to one of ordinary skill in the art upon reading the detailed description which follows.

Description of the Drawings

Fig. 1 is a perspective view of a sports shoe having an  
30 articulate collar according to the present invention, as viewed from the top, right side;

Fig. 2 is an enlarged rear elevational view of the articulate collar of Fig. 1;

Fig. 3 is a cross-sectional view along line 3-3 of Fig.  
35 2;

Fig. 4 is a cross-sectional view along line 4-4 of Fig.  
2;

- 3 -

Fig. 5 is an enlarged exploded side view of the rear portion of the sports shoe shown in Fig. 1; and

Fig. 6 is an enlarged side view of an alternate embodiment of an articulate collar according to the present invention.

Detailed Description

Fig. 1 is a top, perspective view of a preferred embodiment of a sport shoe 1 according to the present invention comprising an upper 2, a sole 4, and an articulate collar 6. The term "upper" is well-known in the art to mean the entire stitched top portion of a shoe. The upper 2 is composed of cloth or leather or the like, and typically contains means, such as laces or velcro strips, to fasten the shoe to a user's foot.

Fig. 2 is an enlarged rear elevational view of the articulate collar 6 of Fig. 1. The articulate collar 6 comprises support members 7 spaced apart from one another to define openings 8 therebetween. The support members 7 are generally rectilinear in shape, and encase, protect and support the achilles tendon area of a user's foot. The articulate collar 6 is a cage-like structure and functions like an exoskeleton to protect the back of a user's foot above the heel. The articulate collar 6 also provides lateral support for the user's ankle. In this embodiment, openings 8 provide for ventilation and allow the support members 7 to move in the vertical plane in response to the movement of a user's foot when the user walks, steps, runs or jumps. This relatively unrestricted motion in the same plane as the ankle joint insures that a user is comfortable when wearing a shoe which utilizes the articulate collar 6, because the shoe offers little resistance to the natural movement of the foot. If desired, the openings 8 can be covered fully or partially filled in or covered, so long as the material used offers little resistance to the functioning of the articulate collar 6 and still permits the relatively unrestricted motion described above.

- 4 -

Fig. 3 is a cross-sectional view taken along line 3-3 of Fig. 2 of the articulate collar 6. The cross-sectional areas 9 of the support members 7 are rectangular or box-shaped in a preferred embodiment so as to be strong enough 5 to provide adequate protection and support for a user's foot, yet are flexible enough to move in concert with the foot as described above. However, the cross sectional areas 9 may be configured differently, for example, in the shape 10 of an oval or triangle, and may be hollow or otherwise if desired. Likewise, the support members 7, which are somewhat rectangular-shaped in Fig. 2, could be of another 15 shape. For example, the support members 7 could be configured to resemble a lightening bolt, or a wave, or some other pattern. Since the support members 7 define the openings 8, any change in configuration of the support members 7 will be reflected in the openings 8.

Fig. 4 is a cross-sectional top view taken along line 4-4 of Fig. 2 of the articulate collar 6. When viewed from above as shown in Fig. 4, the support members 7 are semi-circular in shape to conform to the back of a user's foot. 20

The articulate collar 6, in a preferred embodiment, is made of a rigid foam material such as a structural foam or of a polymer material, or an appropriate composite of such materials, and is fabricated using known methods such as 25 utilizing molds or the like. Examples of such materials include polyurethane, neoprene, urethane, vinyl, or other rubber or plastic materials. One advantage of using a urethane substance to fabricate the articulate collar 6 is that such a material can be easily painted. Thus, graphic 30 designs can be easily applied if desired. Referring to Fig. 3, an inner liner 10 is attached to the inside surface of the articulate collar 6. The inner liner 10 may be comprised of terry cloth, nylex, suede or other material. The material used to fashion the inner line 10 is preferably 35 one which will aid in holding a user's foot in place within the sport shoe 1. However, it is not necessary to utilize the liner 10 in order to practice the present invention.

- 5 -

Fig. 5 is an exploded, simplified view of the rear section of the sport shoe 1 having an articulate collar 6. The articulate collar 6 is connected to a substrate 12 which is also connected to the sole 4. A heel counter 14, 5 preferably made of a rigid plastic material, is attached to the substrate 12 and the sole 4 of the sport shoe 1 to form a lower support part. The heel counter 14 can be connected to the sole 4 in any number of well-known ways, including using glue. In the embodiment shown, the heel counter 14 is 10 attached to cover the substrate 12 and the top edges 16 of the heel counter overlap with the bottom edge of the articulate collar 6. The upper 2 is connected to the articulate collar 6, heel counter 14, and sole 4. The upper 15 2 covers the substrate 12, heel counter 14 and the connection of the heel counter 14, substrate 12 and articulate collar 6 when the sport shoe 1 is assembled. Preferably, the articulate collar 6 is glued or sewn to the substrate 12, and the heel counter 14 is glued to the substrate 12. However, other methods known to those skilled 20 in the art may be used to attach these components.

The method of construction of the sport shoe 1 described with reference to Fig. 5 results in a shoe having an articulate collar 6 which provides improved lateral support for a user's ankle, while simultaneously protecting the 25 achilles tendon area. In addition, the openings 8 provide ventilation and the support members 7 move as the achilles tendon area moves with the natural movement of the ankle joint, which increases user comfort.

Figs. 1 - 5 depict an articulate collar 6 having three 30 support members 7 and two openings 8. However, the present invention encompasses any structure having at least two support members, connected to the rear portion of a shoe.

Further, a plurality of support members greater than three may be used, having openings between such members. 35 Also, vertical members may be used to connect the support members together. Fig. 6 depicts an alternate embodiment of

- 6 -

an articulate collar 66 having such vertical members 68 connected to the support members 77. If vertical members 68 are used, care must be taken to ensure that the articulate collar 66 does not offer substantial resistance to the  
5 natural movement of the foot in the vertical plane so that the shoe is comfortable when it is being worn.

Although the invention has been described with respect to sport shoes, it is contemplated that an articulate collar according to the present invention could also be used in  
10 other types of footwear. Numerous modifications and variations of the above described aspects of the present invention are also contemplated and may be found beneficial by those skilled in the art. Thus, the description of the embodiments provided herein is meant to be merely  
15 illustrative, and is not to be construed as limiting the scope of the principles taught.

My invention is defined by the following claims.

**SUBSTITUTE SHEET**

- 7 -

I Claim:

1. A shoe comprising:

an upper;

a sole;

5 means for attaching the sole to the upper; and  
an articulate collar positioned at the rear portion of  
the shoe, the articulate collar comprising at least two  
support members, wherein the articulate collar laterally  
supports a user's ankle and the support members can move in  
10 concert with the movement of the user's foot.

2. The shoe of claim 1, further comprising:

a heel counter connected to the sole.

3. The shoe of claim 1, wherein the support members define  
an opening between them.

15 4. The shoe of claim 1, wherein the interior portion of the  
support members, viewed from above, are semi-circular in  
shape.

5 The shoe of claim 1, wherein the articulate collar is  
composed of a molded polyurethane foam polymer.

20 6. The shoe of claim 1, wherein the articulate collar is  
composed of a neoprene foam material.

7. The shoe of claim 1, wherein the articulate collar is  
composed of a urethane foam material.

25 8. The shoe of claim 1, wherein the articulate collar is  
composed of blown vinyl.

9. The shoe of claim 1, further comprising an inner liner  
attached to an inner surface of the articulate collar.

**SUBSTITUTE SHEET**

- 8 -

10. The shoe of claim 9, wherein the inner liner is composed of a nylex material.

11. The shoe of claim 9, wherein the inner liner is composed of a terry cloth material.

5 12. The shoe of claim 9, wherein the inner liner is composed of a suede material.

13. The shoe of claim 1, wherein the articulate collar comprises a plurality of support members.

10 14. The shoe of claim 1, wherein the articulate collar further comprises vertical members connecting adjacent support members.

15. A shoe, comprising:

an upper having a top, bottom, front and a rear end;  
a sole;

15 means for connecting the sole to the bottom of the upper;  
and

20 an articulate collar connected to the rear end of the upper wherein the articulate collar comprises at least two support members having an opening therebetween, and wherein the articulate collar laterally supports a user's ankle and the support members can move in response to the movements of a user's foot.

16. A method of constructing a shoe having an articulate collar, comprising:

25 attaching a substrate to a sole at the rear of the sole;  
attaching the bottom edge of an articulate collar to the substrate wherein the collar comprises at least two support members spaced from one another; and

30 attaching an upper to the top edge of the sole, to the substrate and to the front and bottom edges of the articulate collar, wherein the upper covers the substrate

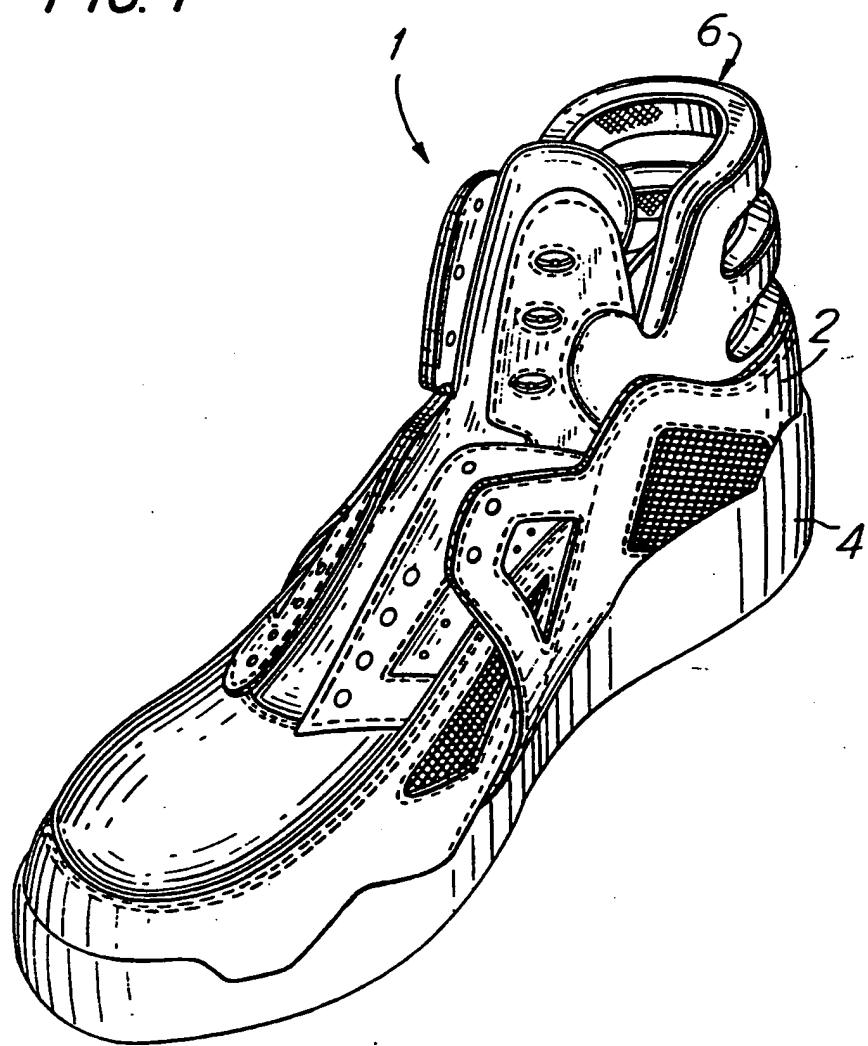
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the connections of the substrate to the sole and to the articulate collar, resulting in a shoe which provides protection for the achilles tendon area and laterally supports a user's ankle.

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1 / 4

FIG. 1



214

FIG. 2

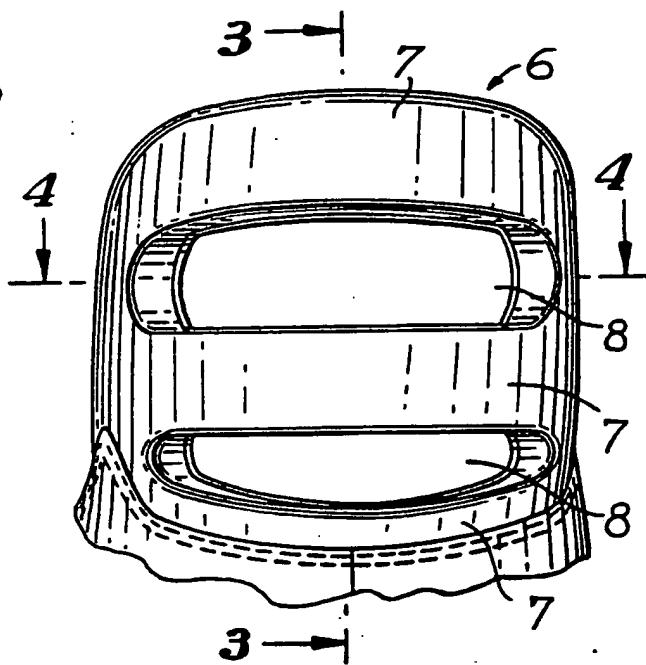


FIG. 3

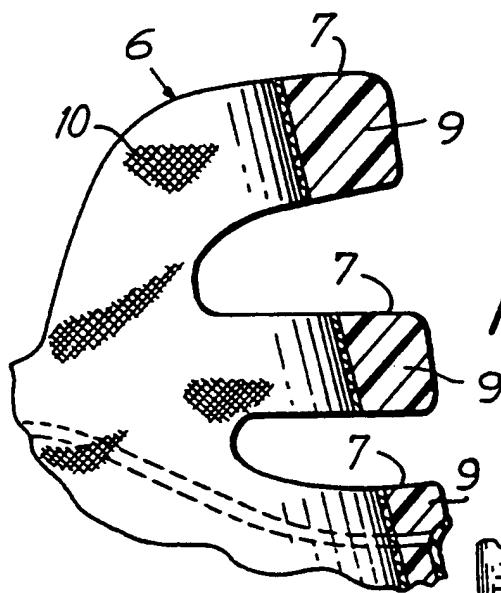
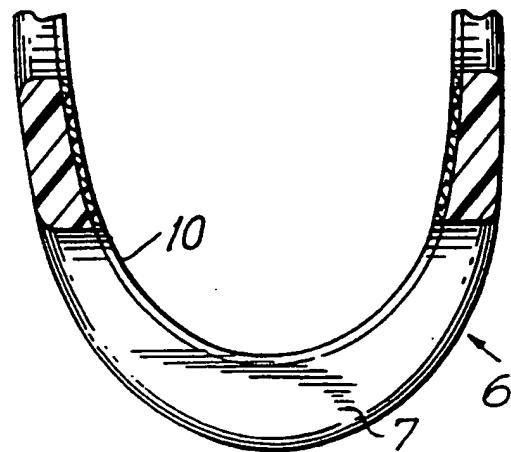
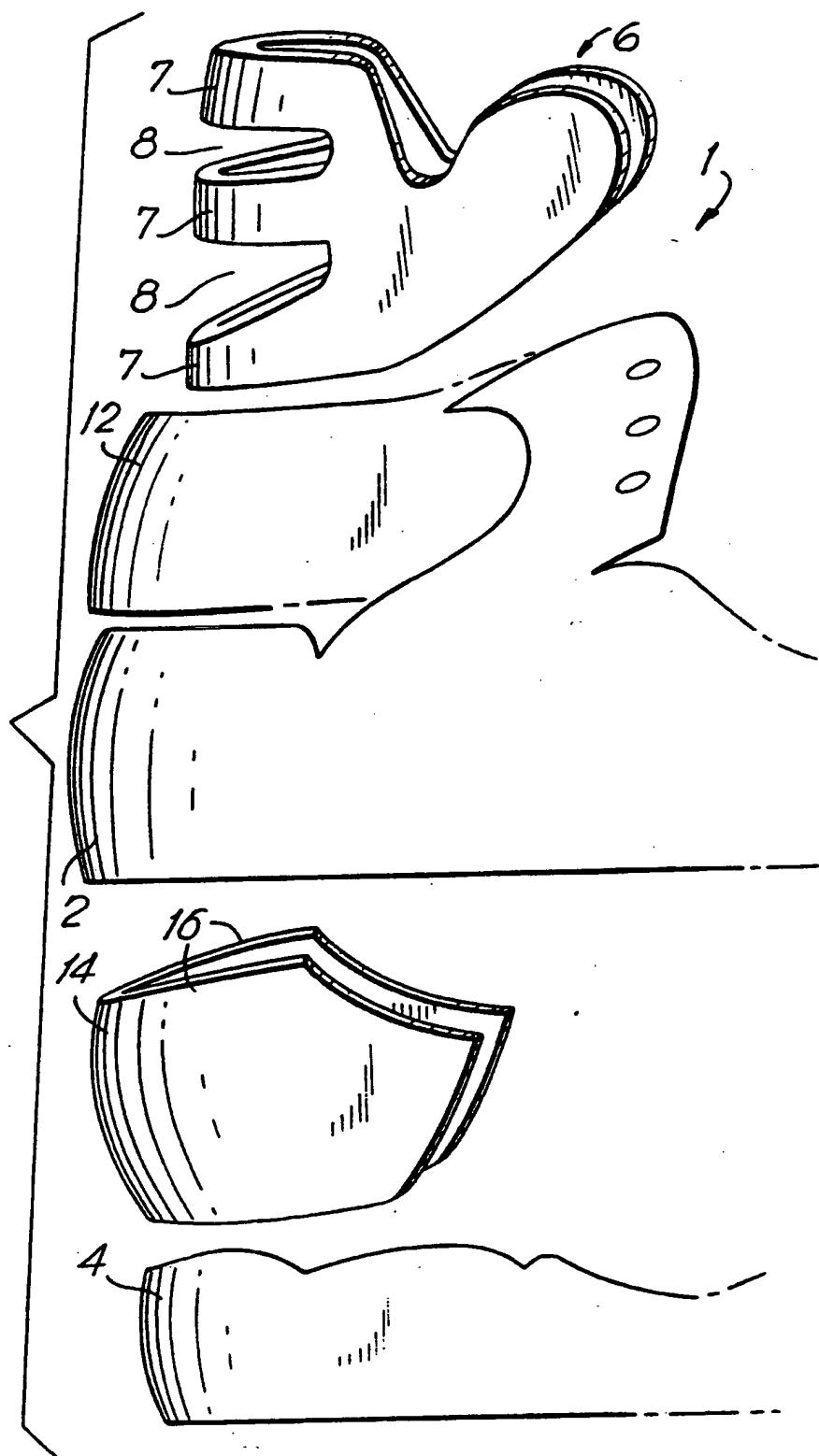


FIG. 4



3 / 4

FIG. 5



414

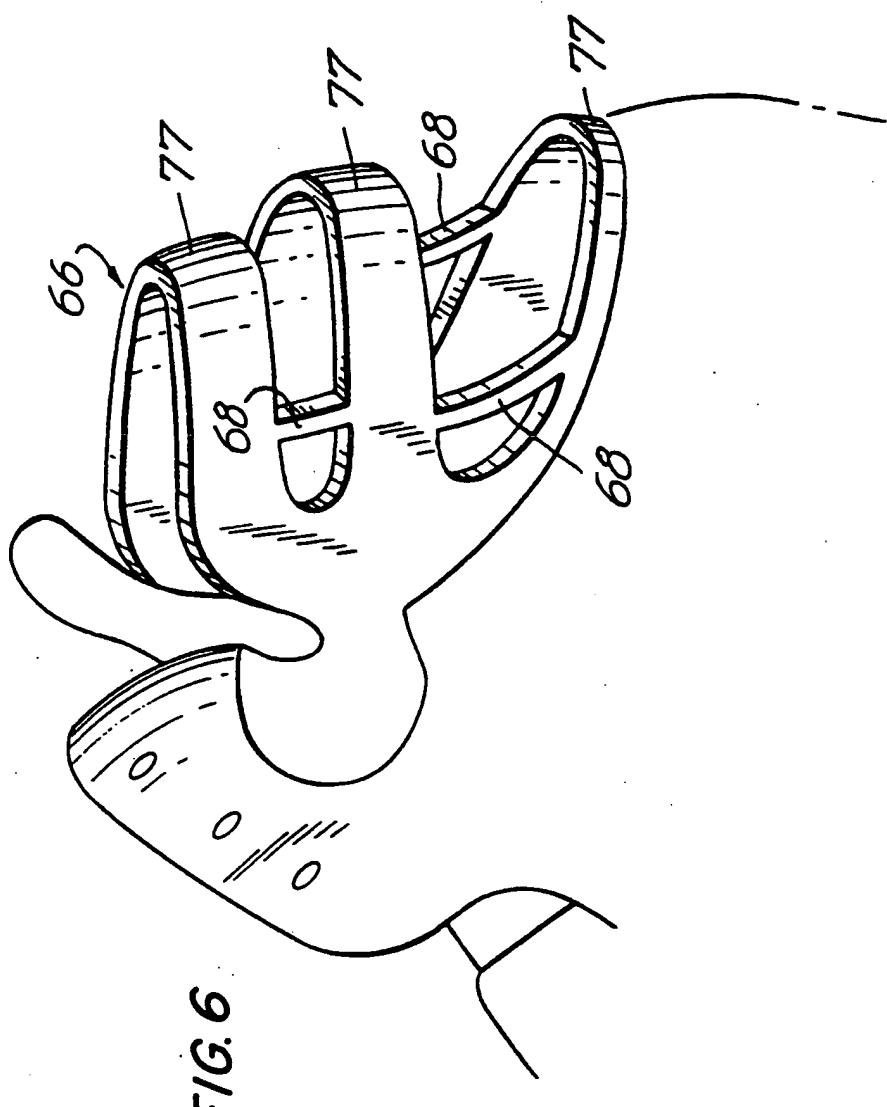


FIG. 6

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US93/04463

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) : A43B 7/20  
US CL : 036/089.000

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : U.S. CL: 036/115,113

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DT, A, 2,606,800 (Dassler) 25 August 1977	see the entire
Y	document.	1,2,4,9,13-15 3,5-8,10-12,16
Y	US, A, 4,655,465 (Schaeffer) 07 April 1987	see the entire
	document.	3
A	US, A, 1,546,551 (Petri) 21 July 1925	
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Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search

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TED KAVANAUGH

Telephone No. (703) 308-1244